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RESEARCH EQUIPMENT: DOD URIP(U) MASSACHUSETTS UNIV
AMHERST DEPT OF POLYMER SCIENCE AND ENGINEERING
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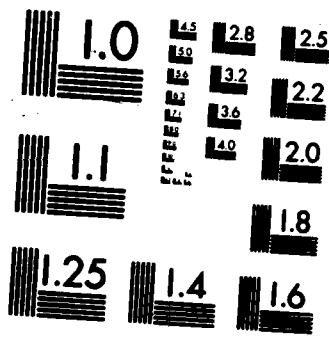
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FINAL REPORT

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MATTHEW J. KERPER

Chief, Technical Information Division

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Grant AFOSR 84-0307

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15 September 1984 - 14 September 1985

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) The grant provided substantial funding for a state-of-the-art transmission-electron microscope and for a variety of spectrometric equipment and ancillary facilities. Both areas of instrumentation are heavily utilized by DoD-related and other polymer science researchers and both provide the most versatile and sophisticated instrumentation available. A used					
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- VI. Junior Research Personnel
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- I. TITLE: Research Equipment: DoD URIP
- II. PRINCIPAL INVESTIGATOR: Dr. Frank E. Karasz
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University of Massachusetts
Amherst, MA 01003
- III. CONTRACT NUMBER: AFOSR 84-0307
- IV. DATES: 15 September 1984 - 14 September 1985
- V. SENIOR RESEARCH PERSONNEL: None
- VI. JUNIOR RESEARCH PERSONNEL: None

VII. ABSTRACT OF ACCOMPLISHMENTS

The grant provided funds for a transmission electron microscope, a FTIR spectrometer, a UV-VIS spectrometer and ancillary equipment. All this apparatus is used extensively by DoD supported P.I.'s in the Polymer Science community. In the case of the electron microscope and the UV-VIS spectrometer the equipment is state-of-the-art, and provides the most modern instrumentation available. The URIP goals have thereby been completely fulfilled.

VIII. DESCRIPTION OF ACCOMPLISHMENTS

The instrumentation provided by the URIP grant falls into three areas.

a) Transmission electron microscope

This is a state-of-the-art JEOL 35CF Transmission Electron Microscope which is heavily used by the E.L. Thomas research group and others. It has been used for morphological studies of block copolymers, of blends, of composites, etc. and provides the most modern capabilities in this area.

b) FTIR Spectrometer

This is an IBM FTIR IR/38 instrument which is used by the blend research group (Karasz/MacKnight) for studying inter-macromolecular interactions in high temperature advanced structural blends.

Figure 1 and 2, attached, provide examples of the resolution achievable with this instrument.

c) UV-VIS Spectrometer

This instrument (Perkin Elmer Lambda 9) and associated electrochemical equipment is being used to study conducting polymers (Figure 3). The resolution and wave-length range have provided unique quantum chemical information concerning electronic transitions in poly (phenylene vinylene). The electrochemical apparatus has permitted quantitative studies of oxidation-reduction (doping) processes in PPV. Together, this instrumentation provides a timely and unique facility.

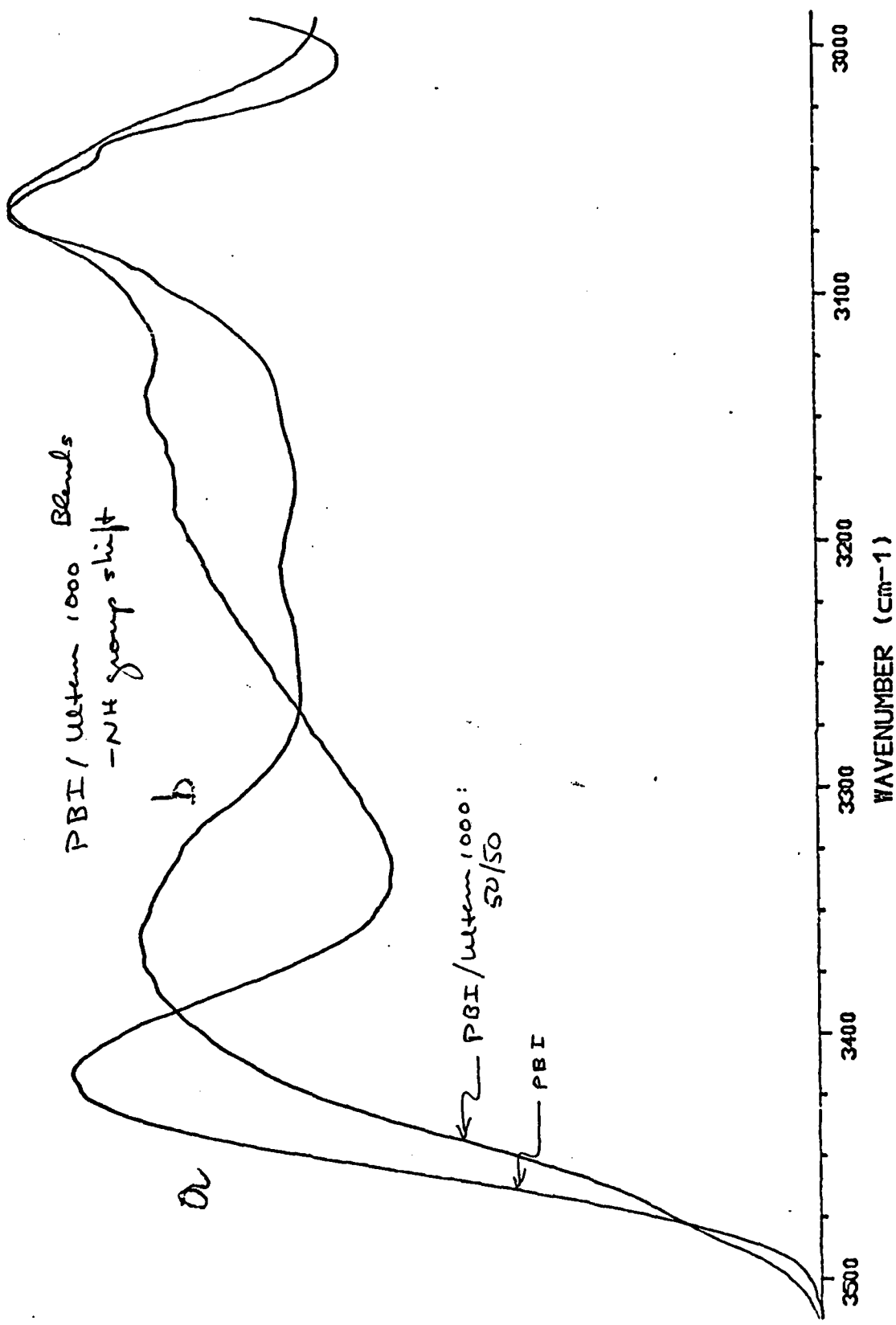
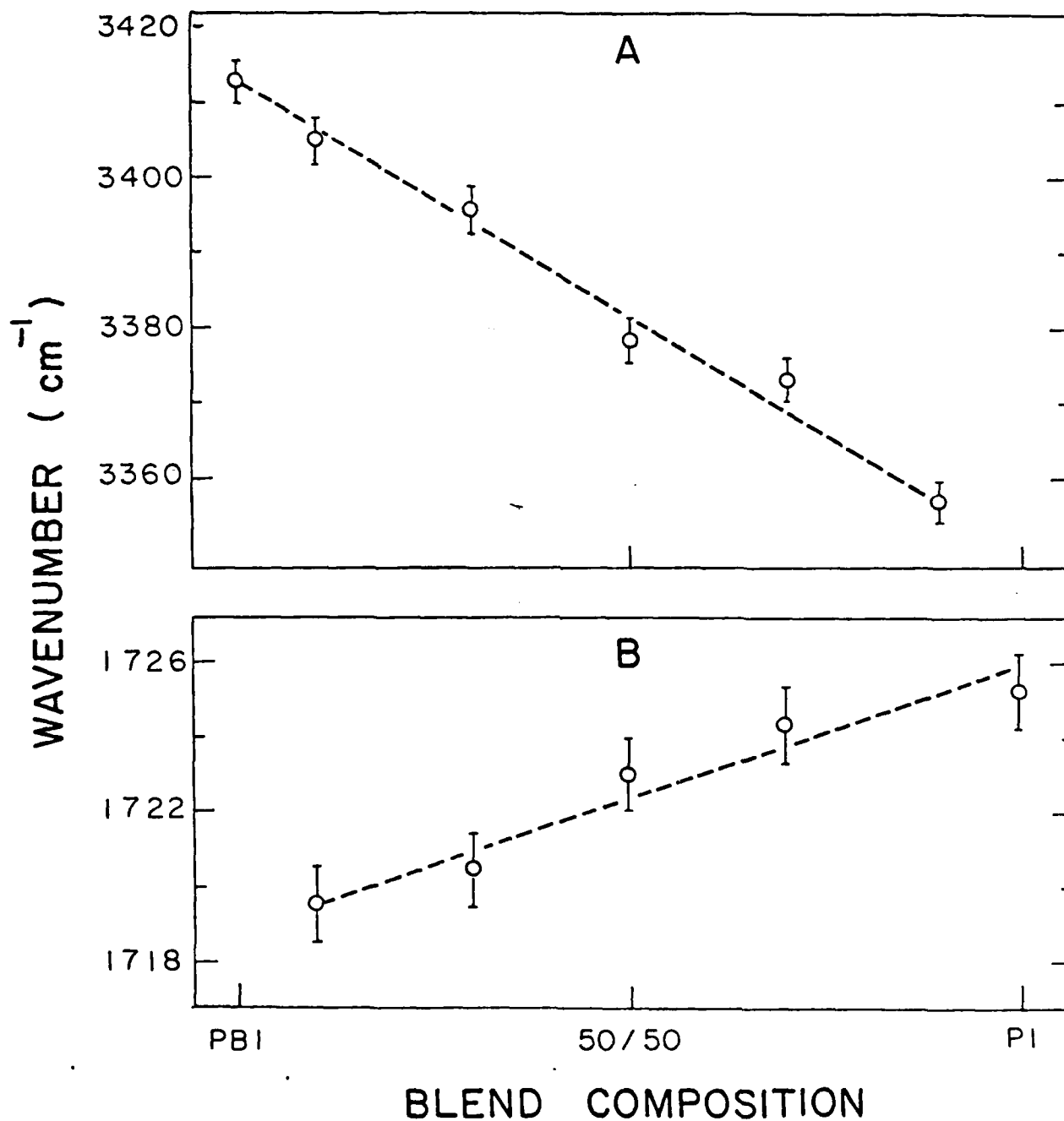


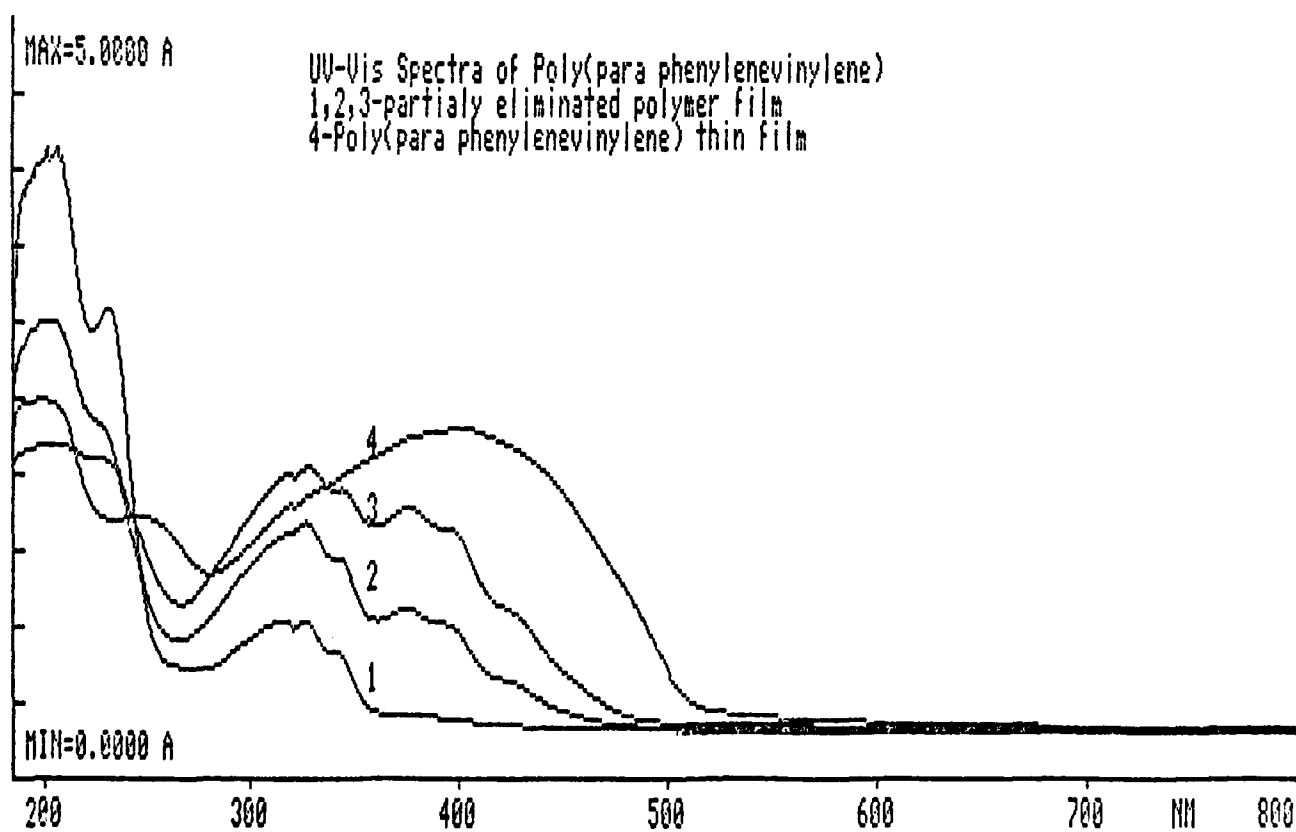
FIGURE 1

FIGURE 2



Interactions, as depicted in λ -shifts, in
 -NH group (A) and carbonyl group (B) in PBI/PI blends.

FIGURE 3



IX. PUBLICATIONS

None

The URIP equipment has been operational for 6-9 months. A very large number of publications in morphology, blends, conducting polymers, and new syntheses coming from this department will to some extent be made possible by this apparatus.

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